

Application Serial No. 10/633,702
Reply to Office Action dated May 18, 2005

REMARKS/ARGUMENTS

In the outstanding Office Action, the Examiner withdrew the restriction of certain claims but held claims 2-8, 11-94 and 96 as being withdrawn as being directed to a non-elected species. Again, this restriction requirement is adamantly traversed on the grounds that no species exist. Instead, a single apparatus having varying modes of operation is disclosed and claimed through product and method claims. In the outstanding office action, the Examiner acknowledges that species should be identified with reference to drawings (which has not been done) and that claims to species can only be properly restricted if the subject matter is mutually exclusive (which they are not). Even though these necessary characteristics of a proper species requirement are acknowledged as not being met, the Examiner has maintained the restriction stating that "the mode of operation of the ion trap is substantially different when the velocity is less than or equal to 50 m/s and when the velocity is zero...Because there is such a fundamental difference in the working order of the two ion traps, the two traps operate in mutually exclusive ways." Respectfully, this is not a proper basis for a species restriction and, if the Examiner continues to maintain this position, it is respectfully requested that the Examiner identify those portions of the MPEP, in a manner done by the Applicant in the last response, which supports the Examiner's position. To date, the Applicant could not find support for the Examiner's contention. To make an analogy, even though a hybrid automobile can operate in two modes, i.e., an internal combustion engine driven mode when operating over 30 mph and an electric drive mode when operating under 30 mph, does not translate into a single patent application covering the hybrid automobile to set forth distinct species. The same is true with respect to the modes when the velocity is less than or equal to 50 m/s and when the velocity is zero in accordance with the present invention. Now the undersigned realizes that there exists an abundance of claims in this application and that the Examiner is under rather tight time constraints. However, the Applicant has paid for examination of all the claims and should, under the present circumstances, be entitled to consideration of all the claims. In any case, as will be outlined below, the Applicant has made an earnest attempt to place the independent claims in clear allowable form to expedite the prosecution.

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With respect to the application of prior art, Independent claims 1 and 94 have been amended to recite that at the later time t_2 four or more axial trapping regions are created, at least some of the ions having travelled at least 50% of the axial length of the ion trap. Original dependent claims 2 and 6 provide basis for this amendment. Claims 2, 6, 33-34, 61 and 86 have been amended in conformity with claim 1. In addition, two new independent claims 97 and 98 have been added, with these new claims generally corresponding to claims 1 and 94 but reciting instead five or more axial trapping regions, at least some of the ions having travelled at least 10% of the axial length of the ion trap. Original dependent claims 2 and 6 provide basis for this amendment as well. The remaining claims have not been amended.

According to amended claims 1 and 94, ions are allowed to travel at least 50% of the length of the ion trap before the axial ion trapping regions are created. New independent claims 97 and 98 are intended to cover an arrangement wherein the ion trap or guide is very long and has many different functions such that the creation of axial trapping regions occurs when ions need only have travelled 10% of the length of the ion guide. As now presented, claims 1, 94 and 97-98 all relate to the creation of a plurality of axial trapping regions after ions have travelled at least some of the length of the ion trap. No such arrangement is taught in the prior art.

US-6744042 (Zajfman) discloses a method for trapping particles between arrays of end electrode mirrors. Voltages applied to the end electrodes cause ions to oscillate inside the trap. Zajfman relates only to the formation of a single trapping region. There is simply no teaching nor suggestion in this document of forming four (or five) or more axial trapping regions along at least a portion of the length of the ion trap, let alone forming four (or five) or more trapping regions at a time when at least some ions have travelled at least 50% (or 10%) of the length of the ion trap.

Claims 9-11, 95 and 96 relate to wherein the velocity of ion trapping regions, which are being translated axially progressively, slows down. From the Office Action, it

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appears that the Examiner considers Zajfman to somehow teach the translation of trapping regions along the axial length of an ion trap. However, Zajfman teaches only the formation of a single trapping region which extends between the electrode mirrors. The Examiner correctly notes that Zajfman does not explicitly teach a progressive reduction in velocity. However, it has incorrectly been inferred that the ion velocity in the ion trap can be adjusted in some way. Zajfman merely describes how the velocity spread of the trapped ions is taken into consideration because it affects the synchronization of the oscillating ions and hence accurate measurement of flight time and mass to charge ratio. There is no teaching or suggestion of altering the velocity of the ions oscillating in the trap, let alone of translating one or more axial trapping regions along the axial length of the ion trap and progressively reducing that velocity.

US-5569917 (Buttrill) teaches a quadrupole ion trap and a method of forming a parallel ion beam for analysis from the ion trap. Ions in the trap may be collisionally cooled in order to localize the ion cloud in the central interaction region. However, there is simply no teaching or suggestion in Buttrill of a mode of operation of an ion trap wherein one or more axial trapping regions are translated along the length of the ion trap at a progressively reduced velocity.

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Based on the above, it is respectfully requested that the restriction requirement be withdrawn, the claims allowed and the application passed to issued. If the Examiner should have any questions regarding this response, the Examiner is cordially invited to contact the undersigned at the number provided below to further expedite the prosecution.

Respectfully submitted,



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